

Translation

TENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

PCT/EP2003/003316



04 OCT 2004

Applicant's or agent's file reference 2699 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/003316	International filing date (day/month/year) 31 March 2003 (31.03.2003)	Priority date (day/month/year) 03 April 2002 (03.04.2002)
International Patent Classification (IPC) or national classification and IPC B61H 15/00		
Applicant KNORR-BREMSE SYSTEME FÜR SCHIENENFAHRZEUGE GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of <u>7</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 31 October 2003 (31.10.2003)	Date of completion of this report 23 March 2004 (23.03.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PCT/EP2003/003316

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages _____ 1-25 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____ 1-18 _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the drawings:
 pages _____ 1/7-7/7 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/03316

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-17	YES
	Claims		NO
Inventive step (IS)	Claims	1-17	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-17	YES
	Claims		NO

2. Citations and explanations**1. Claim 1:**

- 1.1 Claim 1 satisfies the requirements for novelty, inventive step and industrial applicability of PCT Article 33(2) to (4).

Since none of the search report citations or documents acknowledged in the introductory part of the description specifies all the features of independent claim 1, the subject matter of claim 1 is novel.

- 1.2 The search report citations offer nothing to suggest to a person skilled in the art to further develop, according to the characterizing part of claim 1, a method for the control of an electrically actuated slack adjustment device (as integral part) of a brake applying device for vehicles, in particular railway vehicles, which method is disclosed in document W001/21977 and comprises the following steps:

a) determination of a **stroke** of brake pads against an assigned brake disc or brake drum during

service braking, according to at least one measured application path travelled by the brake pads and a measured brake force value assigned to the application path;

- b) comparison of the actual **stroke** with a **target stroke** or a **target stroke** tolerance range and, if the actual **stroke** deviates therefrom, calculation of an adjustment path from the deviation.

- 1.3 The measure wherein the stroke determined under a) is the actual application stroke (which is part of the adjustment path) and the slack adjustment is not carried out by adjusting a clearance when the service brake is released but takes the form of step c) an "electronic control of the slack adjustment device (156, separate module) as a function of the calculated adjustment path", results from a step which is not a logical development of the cited prior art.

The method according to claim 1 therefore involves an inventive step.

- 1.4 The problem to be solved by the present invention is understood to be that of ensuring that the slack adjustment occurs independently of components of the service brake. As a result, the service brake can have a smaller operating stroke because with a component of this kind, brake pad wear no longer has to be taken into consideration.

- 1.5 The method according to claim 1 can be made and used in industry and is therefore considered industrially applicable.

2. Claim 9:

- 2.1 Claim 9 satisfies the requirements for novelty, inventive step and industrial applicability of PCT Article 33(2) to (4):

Since none of the search report citations or documents acknowledged in the introductory part of the description specifies all the features of independent claim 9, the subject matter of claim 9 is novel.

- 2.2 The search report citations offer nothing to suggest to a person skilled in the art to further develop, according to the characterizing part of claim 9, a method for the control of an electrically actuated slack adjustment device of a brake applying device for vehicles, in particular railway vehicles, which method is disclosed in document WO01/21977 and comprises the following step:

a) actuation of the brake applying device (1) until the brake pads (12) have reached a predefined **target point** or a **target point** tolerance range.

- 2.3 The measure according to which the target point is the target contact point and which comprises the steps:

b) electrical actuation of the slack adjustment device (156) until a measured electric brake force signal is obtained for the first time; and
c) return of the brake applying device (1) to the release position;

results from a step which is not a logical development of the cited prior art.

- 2.4 The method according to claim 9 can be made and used in industry and is therefore considered industrially applicable.

3. Claim 11:

Claim 11 satisfies the requirements for novelty, inventive step and industrial applicability of PCT Article 33(2) to (4).

Since none of the search report citations or documents acknowledged in the introductory part of the description specifies all the features of independent claim 11, the subject matter of claim 11 is novel.

The search report citations offer nothing to suggest to a person skilled in the art to configure the slack adjustment device in accordance with the characterizing part of claim 1 in a device for controlling an electrically actuated slack adjustment device of a brake applying device for vehicles, in particular railway vehicles, disclosed in document DE-C-44 13 169 and comprising:

- a) sensors for measuring at least one application path travelled by brake pads and a brake force value assigned to this application path during service braking, and for generating corresponding output signals;

- d) means for controlling the slack adjustment device in accordance with the calculated adjustment path.

The measure according to which the following technical features are included:

- b) means for determining an actual application stroke of the brake pads against a brake disc or brake drum assigned thereto in accordance with the output signals;

- c) means for comparing the actual application stroke with a target application stroke or a target application stroke tolerance range and for calculating an adjustment path from the deviation,

results from a step which is not a logical development of the cited prior art. The slack adjustment device according to claim 11 therefore involves an inventive step.

The method according to claim 11 can be made and used in industry and is therefore considered industrially applicable.